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ARCHIVES
OF
CLINICAL SURGERY.

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EDITED BY

EDWARD J. BERMINGHAM, M. D.

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VOL. I, AUGUST, 1876. NO. 2.

ORIGINAL PAPERS.

ON CONTRACTION OF THE PALMAR FASCIA,
AND OF THE
SHEATHS OF THE FLEXOR TENDONS,

BY
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The palmar fascia is an aponeurotic expansion beneath the integument of the palm of the hand, attached at its upper extremity to the transverse carpal ligament, and to the aponeurosis of the palmaris longus, where it is not more than an inch in breadth, and where its fibres are compacted into a firm mass of considerable thickness. The lower extremity expands to nearly the whole breadth of the hand, and is much thinner than the upper extremity—many of the fibres being inserted into the skin in front of the metacarpo-phalangeal articulations, and others, extending along the sides of the fingers, are attached to the sheaths of the flexor tendons. The morbid condition of the fascia, which constitutes the subject of the present paper, is usually, if not always of traumatic origin, being the result of frequently repeated and protracted pressure of hard substances against the palmar integument, as in rowing a boat, or in handling an axe, a chisel, or other tools. As a consequence of the pressure to which the integument of the palm is subjected, it becomes more or less inflamed and indurated, and more firmly adherent to the subjacent fascia, which gradually contracts so as to induce a permanent flexion of the fingers, at first to a slight degree, but progressively increasing until in some cases the ends of the fingers are almost in contact with the palm of the hand. There is, for the most part, little or no pain when the parts are left to themselves, but great resistance is offered to any attempt at extension, and severe pain is induced, if much force be employed in this way. No resistance is offered to the attempt to flex the fingers to an additional degree. Indurated and knotty cords can be seen and felt, extending from the palm to the fingers, and the firmness of these cords is greatly increased by an attempt to extend the fingers. These cords are formed by contracted bands of the palmar fascia together with the closely adherent integument. The skin of the palm at a number of points is drawn into folds in the form of arcs of circles whose concavities look downward towards the fingers. The disease not only produces very considerable deformity, but the functions of the hand are seriously impaired. This morbid condition may be confined to one hand, or both may be involved. The fingers are not usually all contracted to the same degree. The ring finger is generally more flexed than the others, and the little finger more than the index or middle finger. In some cases there is in addition to the contraction of the palmar fascia, a contraction of the sheath of one of the flexor tendons, producing a more obstinate and unyielding flexion of the affected finger. This contraction of the sheath of the tendon is usually confined to the vicinity of a single articulation, ordinarily that of the first with the second phalanx. Contraction of the palmar fascia is to be carefully diagnosticated from persistent flexion of the fingers occasioned by other causes. One or more of the fingers may be permanently flexed in consequence of division of the extensor tendon of the same finger or fingers by direct mechanical violence or by sloughing. Flexion of the fingers may also occur from cicatricial contraction after severe burns, or wounds, or contusions with loss of substance. It may occur from paralysis of the extensor muscles, from gouty, or rheumatic, or traumatic inflammation of the digital articulations, or from spasmodic or organic contraction of the flexor muscles. There is for the most part no difficulty in the diagnosis, if the condition of the parts and the history of the case be carefully investigated. Flexion from paralysis of the extensor muscle, or division of the corresponding tendon is distinguished by the fact that no resistance is offered to passive extension of the finger. Cicatricial contractions are recognized by the history of the case, and by the obvious appearance of the scar. Flexion from articular inflammation is distinguished by the swollen condition of the joint, and the rigidity which constitutes an obstacle not only to extension but to further flexion. Flexion from persistent contraction of the flexor muscle or tendon is recognized by the tension of the affected tendon, and the ease with which the finger may be extended when the flexor muscle is relaxed by extreme passive flexion of the wrist.

Contraction of the palmar fascia has not usually been recognized by writers on surgery. The flexion of the fingers depending on it, has generally been ascribed to other causes, especially to abnormal contraction of the flexor tendon. One of the first authors who recognized the true character of the disease was Dupuytren, and the first published account by him, is contained in his "*Lecons Orales de Clinique Chirurgicale.*" He quotes Boyer, who gives an account of flexion of the fingers, due to what he calls Crispatura Tendinum, or contraction of the tendons. It is evident from Boyer's description, that the abnormal contraction, which he erroneously describes by this name, is located in the palmar fascia, and not in the tendons. Boyer suggests that, in the early or incomplete stage of this disease, it might be arrested by confining the hand to a straight splint, but that when it has reached a considerable degree, it is an incurable disease, a "*mal sans remedie.*"

Dupuytren also quotes Sir Astley Cooper, who speaks of the fingers being retracted in consequence of chronic inflammation of their sheaths, and of the palmar fascia. When the contraction is confined to the palmar fascia, he recommends the division of the contracted band, and the application of a splint to straighten the finger. But he regarded the case as beyond the reach of art, when the sheath of the tendon was involved.

Dupuytren first demonstrated the true character of the disease, on the death of an old man, who had long been affected with a persistent flexion of the fingers. He examined the hand with great care, dissecting off the skin from the palmar surface of the hand and fingers. As soon as the skin had been removed from the subjacent parts, its arched folds and wrinkles were at once effaced, showing that the proper seat of the contraction was not in the skin itself. The fingers remained flexed ; on attempting to extend them, the movement was arrested by firm fibrous bands which evidently belong to the palmar fascia. He then divided the contracted bands of the palmar fascia, and there remained no obstacle to the complete extension of the fingers. He then opened the tendinous sheaths, and found the tendons in a perfectly normal condition. He also examined the digital articulations, and found them entirely free from disease. He thus demonstrated the fact, at that time generally unknown to the profession, that the seat of the contraction was in the palmar fascia, and not, as had been generally supposed, in the flexor tendons.

Having arrived at a correct appreciation of the true pathology of the disease, Dupuytren, not long after, had the opportunity of undertaking the treatment of a case. On the twelfth of June, 1831, he operated on a wine merchant, who had flexion of the ring and little fingers, occasioned by contraction of the palmar fascia. He divided the contracted bands, straightened the fingers, and confined them to a padded splint in an extended position. The operation was followed by a considerable amount of inflammation and suppuration, but the wounds were thoroughly cicatrized by the second of July. The splint was worn day and night until the second of August, after which it was worn only at night. The fingers were at first very stiff, and their motion very imperfect, but the patient gradually regained the power of flexing and extending them.

Since Dupuytren first demonstrated the true character of this disease, and furnished a detailed account of its treatment, the subject has been largely ignored by the profession, and comparatively few surgeons have made any allusion to its pathology or its treatment.

My attention has been directed to the disease for several years past, and my observation has, in the main, confirmed the correctness of Dupuytren's description. I am satisfied, however, that he has erred in excluding contraction of the sheaths of the tendons from any participation in the production of the deformity. There are, no doubt, many cases in which contraction of the palmar fascia is the exclusive cause of the persistent flexion of the fingers, but I hardly think it possible that my observation could have deceived me as to the fact that, in some cases, the tendinous sheath is also at fault.

With regard to the prognosis, it may be regarded as an established fact, that the disease, when left to itself, undergoes no amelioration, and that whatever change takes place is from bad to worse. But if the contracted bands be thoroughly divided, and the affected fingers brought into an extended position, and secured by proper splints, and if passive motion be vigorously and persistently applied, the deformity ued, but have enjoined the patient to practice passive motion perseveringly for a long time, both in the direction of flexion and extension. The hand is now free from deformity, except that the ring finger is somewhat swollen. Flexion is still quite limited in the ring and little fingers and is by no means perfect in the index and middle fingers. It is probable that perfect flexion will not be restored to the ring finger.

CASE 4.—Mrs. Ann Meyer, aged 19, applied at my clinic November 7, 1874, with index finger of right hand flexed at a right angle, at the articulation of the second phalanx with the first, and at the articulation of the third with the second. There was scarcely any appreciable motion at either of these articulations. The rigidity was evidently due to contraction of the sheath of the flexor tendon. The contraction had occurred as a sequela of subfascial inflammation in the palm of the hand, over the articulation of the first phalanx of the index finger with its metacarpal bone, in March, 1873. The inflammation had been attended with severe pain, and ten days had been allowed to elapse before an incision was made for the relief of tension, and the evacuation of matter.

November 7.—I made four transverse incisions through the sheath of the flexor tendon, one of the incisions fully exposing the tendon to view. I was then enabled to straighten the finger, and to secure it to a splint, which was also applied to the dorsal surface of the fore-arm and hand.

December 14.—At the end of a week, during which the splint was several times removed and reapplied, passive motion having been made at each dressing, the use of the splint was abandoned, and the finger dressed with strips of adhesive plaster applied around it, so as to maintain the finger in a position of nearly complete extension. These dressings have been continued until the present time. There was a moderate amount of suppuration for the first fortnight after the operation; but the wounds are now completely healed. The finger is straight. There is free motion at the articulation of the first phalanx with its metacarpal bone, and quite limited motion at the two other articulations of the finger. The patient can put on a glove, and can play on a piano. She is directed to make persevering use of passive motion.

CASE 5.—On the 11th of June, 1875, I was called to see Kate R., a little girl, four years of age, who had the ring finger of her left hand rigidly flexed at a right angle, at the articulation of the second phalanx with the first. The deformity was the result of a contused wound.

received a month before, from pulling over on her hand a heavy piece of a bedstead. The integument was drawn into a rigid band, which would not yield to an attempt to extend the finger. I made three transverse incisions through this band, but could not extend the finger until I had carried one of these incisions through the sheath of the tendon. I then secured the finger, hand, and fore-arm, by adhesive plasters and a bandage, to a felt splint.

June 16.—There has been no inflammation, and no pain. I removed the splint and reapplied it, after making passive motion. The little wounds were nearly healed. Passive motion, in the direction of flexion, gave pain.

October 12.—Deformity entirely removed. The finger is straight, and can be flexed to a moderate degree.

In each of the six hands on which I have operated for contraction of the palmar fascia, and of the sheaths of the flexor tendons, as reported in this paper, it will be observed that, after the fingers had been straightened, and the deformity removed, the power of flexing the affected fingers was very much diminished, and that the attempt to flex them occasioned severe pain. The inability fully to flex the fingers, and the pain occasioned by the attempt, occurred not only in those fingers which had been abnormally flexed by the disease, but in those whose condition had been normal when the treatment was commenced, whether the affected fingers had been confined to the splint, or had been left at full liberty during the whole of this treatment. The ability to flex the fingers to the full extent is very slowly regained, and in some cases the patient never fully regains it. It is somewhat remarkable that, while the obstinate forced flexion occasioned by the disease can be in a great measure or wholly overcome in a comparatively brief period, the power of flexion should be lost, and that its restoration should be attended with so great difficulty, and should require so long time. But even with this drawback, the substantial benefits resulting from the treatment commend the curative process to the attention of surgeons, and entitle it to rank among the established resources of the healing art.

For the illustration accompanying this paper, I am indebted to the kindness of Dr. Charles T. Poore.

may be effectually overcome, and a very useful degree of motion may be restored. But my observation does not lead me to the belief that, in old cases, perfect freedom of motion can ordinarily be regained. The operation of dividing the contracted bands should be performed while the patient is under the full influence of an anæsthetic, and consequently the operation itself occasions no pain. But the subsequent treatment is tedious and painful, being protracted through a period of several months. The patient should be fully informed beforehand that it is no trifling infliction that he is to undergo. But if he has the proper degree of fortitude to endure the curative process, he will be amply rewarded by the result of the treatment.

In dividing the contracted bands of the palmar fascia, I recommend that incisions be made at a number of points, wherever they are capable of relieving tension. The adhesion of the palmar fascia to the skin is so close, that a strictly subcutaneous section cannot be made. but the skin should not be divided more extensively than is absolutely required. The wounds should be at once closed with adhesive plaster, and the fingers should be brought into an extended position. This position should be maintained by applying to the back part of the fore-arm and hand, and of the affected fingers, a metallic splint, adapted to the surface, with an intervening layer of lint, or of cotton or woolen batting. The fingers should be secured to the corresponding portions of the splint by narrow strips of adhesive plaster. The fore-arm and hand may be secured by means of a roller bandage. The dressings should be renewed at intervals of one, two, or three days, the parts should be washed, and wiped dry, and passive motion should be freely applied. Passive motion is quite painful to the patient, but it is an important means of restoring mobility to the fingers. The details of the treatment can, perhaps, be better understood, by the recital of several cases which have come under my observation.

Case 1.—Contraction of palmar fascia from neglected paronychia. Jane Carr, aet 28, applied at my clinic, May 18, 1869, on account of a paronychia which had existed seven weeks, and for which no efficient treatment had been resorted to. The seat of the inflammation was the index finger of the right hand over the second phalanx. Ulceration had occurred, and some discharge of purulent matter had taken place. Secondary inflammation had occurred in the palm of the hand over the metacarpal bone of the index, and fluctuation was now perceptible. I made a free and deep incision over the original seat of the inflammation and another over the seat of the secondary inflammation. I directed emollient poultices for three days, and the wounds to be then dressed with pledgets of lint spread with ung. resin..

May 25.—The inflammatory swelling has in a great measure subsided, and the pain is relieved.

June 1.—The incisions have healed, and have left slightly depressed cicatrices. A contraction of the palmar fascia has occurred, causing all the fingers of the right hand to be flexed, and the effort to extend them causes severe pain. Flexion of the wrist does not facilitate extension of the fingers, showing that the flexion is due to contraction of the palmar fascia, and not of the flexor tendons.

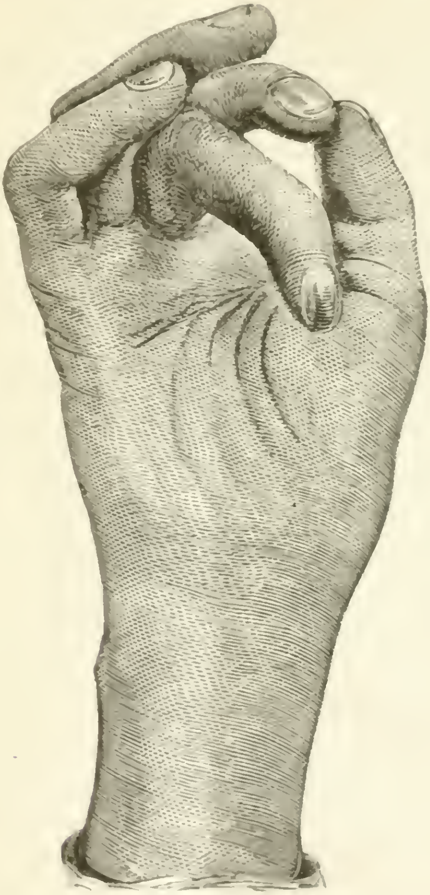
June 8.—The contraction of the palmar fascia has increased, and it threatens to produce permanent deformity. I applied a brass splint to the dorsal surface of the fore arm, hand and fingers, secured in the extended position by strips of adhesive plaster and a roller bandage.

June 29.—I have readjusted the apparatus at intervals of two or three days, making passive motion at each time to such an extent as to occasion severe pain to the patient. To-day I determined to leave off the apparatus.

July 14.—There seems to be very little tendency to recurrence of the deformity. The fingers are somewhat stiff in the extended position, and the effort to flex them to any considerable extent is painful. The patient is, however, slowly gaining power over the middle, ring, and little fingers, but there is very little motion of the index, and it is probable that the motion of that finger will not be regained.

From the last date this patient passed from my observation. The case is interesting from the fact that the disease was observed at a very early period, and that I was consequently enabled to overcome the mal-position of the fingers by stretching the palmar fascia without dividing its fibres.

Case 2.—Contraction of palmar fascia, occurring several years after traumatic inflammation in the palm of the hand. Dr. C. A. R., an eminent surgeon, aet. 43, came under my care July 21, 1869, on account of deformity and impaired function of the right hand. The first phalanx of the little finger was bent at a right angle with the metacarpal bone; the second phalanx at a right angle with the first; the third phalanx at an obtuse angle of about 160° degrees with the second. The first phalanx of the ring finger was bent at an angle of 110° with the metacarpal bone; the second phalanx at an angle of 150° with the first. At the articulation of the metacarpal bone of the middle finger with the first phalanx, and of the first with the second, there was a deviation of 10° or 15° from a right line. All of the phalanges could be flexed freely into the palm of the hand, but they could not be extended beyond the points indicated. Extreme flexion of the wrist did not in any degree liberate the fingers. The palmar fascia was drawn into prominent bands connected with the contracted fingers.



Contraction of the Palmar Fascia and of the Sheaths of the Flexor Tendons.

In the year 1863, Dr. R. had been surgeon of the 159th Regiment, New York Volunteers, on duty at Port Hudson. While there he had an abscess near the distal end of the metacarpal bone of the little finger, which he attributed to pulling the rope of a hammock in which he was accustomed to swing. There was also a secondary abscess in the axilla. Six or eight weeks elapsed before the healing of the abscess on the hand. No contraction of the palmar fascia or bending of the fingers was observed until about two years ago. When the contraction was first observed, the little finger alone was affected. Six months afterwards the ring finger also became contracted. The contraction reached its maximum about a year ago. While the contraction was taking place, the affected parts were not positively painful, but they were a little uneasy and tender.

July 21, 1869, the patient being in a state of anæsthesia from the inhalation of ether, I made transverse incisions through the palmar fascia and the adherent integument in the palm of the hand in two places. After these incisions, the first phalanges of all the affected fingers, and the second phalanges of the ring and middle fingers were liberated so that they could be fully extended. But the second and third phalanges of the little finger remained contracted as before, by a hard band on the palmar surface, to which the skin was closely adherent. I made a free transverse division of this band, which proved to be the thěca of the flexor tendon. After dividing this, I could straighten the second and third phalanges, but not without using some force. I attached the fore-arm, hand, and little and ring fingers by their posterior surface to a brass splint, securing the fingers, by strips of adhesive plaster, and the hand and fore-arm by a roller bandage.

August 2.—I have continued to readjust the apparatus and to make passive motion at intervals of two days. The passive motion occasions considerable pain. The tendency to contraction seems to be in a great measure overcome. More pain is occasioned by flexing the fingers than by extending them. The little finger is much swollen, the swelling seeming to be partly due to œdema and partly to inflammation of the fibrous tissue. As I am about to leave the city tomorrow, on a journey which will occupy me about a month, I advised the patient to return home and to continue the treatment at his own residence.

September 5.—Dr. R. called on me with his fore-arm and hand free from the apparatus which he now wears only at night. The fingers are very nearly straight. The swelling and rigidity are gradually diminishing, and he is slowly gaining the power of flexing the fingers by muscular action. The attempt to produce complete flexion still occasions great pain.

January 27, 1871.—I met Dr. R. and examined his hand. I found that the ring and little fingers were flexed at an angle of about 135°, and could not be further extended by the action of their own muscles. They could be flexed without pain. The divisions of the palmar fascia, going to the affected fingers, especially to the ring finger, were prominent in the palm of the hand, and presented a knotty appearance and feel. This condition has occurred within the last four or five months. I recommended wearing a glove with whalebone on the dorsal surface of the affected fingers. Although this patient was very much benefited by the treatment, the cure was not as complete as I think it would have been if he had remained a longer time under my care.

Case 3.—E. B., a lawyer from Ohio, aet. 44, came under my care in May, 1869. For many years past the patient has been in the habit of cutting wood with an axe, and of rowing boats for exercise. In the year 1858 he first noticed a contraction in his left hand, by which the ring finger was drawn into a flexed position, and the little finger of the same hand subsequently became flexed in a less degree. Two or three years afterwards the little finger of the right hand became flexed in the same manner, and this was followed after a short interval by a minor degree of contraction of the ring finger. The contraction in both hands has been progressive to the present time. The middle fingers of both hands are but slightly involved in the contraction, and the indices not at all. The left ring finger is bent at a right angle, at the articulation between the first and second phalanges. The left little finger is bent at an angle of about 45° at the metacarpo-phalangeal articulation. The contraction of the ring finger was chiefly at the metacarpo-phalangeal articulation until about two years ago, when he had a fall which injured the articulation between the first and second phalanges. The right little finger is bent nearly at a right angle; the ring finger at an angle of about 45°, and the middle finger to a much less degree. The flexion of the right hand in each of the fingers involved is at the metacarpo-phalangeal articulation. In the palms of both hands are prominent bands, corresponding with the divisions of the palmar fascia, and the skin is wrinkled and adherent to the fascia. The contracted fingers are not in the slightest degree liberated by flexing the hand upon the fore-arm. The patient has full power of flexing all the fingers, but cannot extend them beyond the points which have been indicated. From all these circumstances I conclude that the contraction is confined to the palmar fascia, and that the tendons are not involved. A different opinion, however, has been expressed by other surgeons, who have advised him not to submit to an operation.

May 27.—The patient being under the influence of ether, I divided the contracted bands of palmar fascia of the right hand, with the adherent integument at several points. The contraction yielded so that the fingers could be brought into a fully extended position; but when they were left to themselves, they became moderately flexed by muscular contraction. I applied a splint of brass to the dorsal surface of the fore-arm, hand, and fingers, interposing woolen batting and lint, and securing the parts in contact with the splint by adhesive plasters and bandages.

May 31.—Removed apparatus, made passive motion, and reapplied apparatus. Since the operation, the patient has had no local inflammation nor constitutional disturbance. There has been aching pain in the parts which had been contracted, and his sleep has been somewhat disturbed, so that at times he would get out of bed and walk about his room for relief. But the pain was not sufficiently severe to induce him to take an anodyne. When I removed the apparatus to-day, the fingers became slightly flexed by muscular action. The passive motion, and especially exaggerated extension gave him severe pain.

June 8.—Since last report, I have removed and reapplied apparatus every other day. The wounds have entirely healed without suppuration. The patient continues to suffer more or less aching pain in the hand, but less than at first. When the apparatus is removed, the fingers remain nearly straight, but the patient has the power of flexing them to a moderate degree. Passive motion is still very painful.

June 23.—The apparatus is now adjusted at intervals of three days. There seems to be little or no disposition to a recurrence of flexion of the fingers. Passive motion in the direction of extreme or exaggerated extension is less painful than at first, but in the direction of flexion, it is apparently becoming more painful. The hand and fingers are a little swollen, and are somewhat tender on pressure; but there is no appearance of active inflammation.

June 29.—The symptoms continuing as at last report, I determined to leave off apparatus for a time, and advised the patient to make frequent and gentle passive motion.

July 1.—The patient is more comfortable without the apparatus. The swelling has not diminished. I advised him to paint over the surface of the hand and fingers with tincture of iodine.

July 14.—The apparatus has been left off to the present time, and it will probably not be necessary to resume its use. There seems to be no tendency to a return of the contraction of the palmar fascia, or flexion of the fingers. There is no appearance of deformity, except one or two slightly indurated points in the palm, and they can hardly be considered as constituting a deformity. The fingers are, however, still rigid, and cannot be flexed more than about 40°. The attempt to flex them beyond this point causes severe pain. The stiffness and pain on flexion affect the index and middle fingers as much as the ring and little fingers. The hand is not so much swollen as a fortnight ago. The patient often wakes with a dull, aching pain, which is relieved by immersing the hand in cold water, after which, he soon falls asleep again. He is slowly gaining the power of using his fingers. He is about to return to his home in Ohio, and expects, after a few months, to return to New York, and submit to an operation on the other hand.

In the treatment of this case, I applied a splint, not only to the ring and little fingers, which had been much contracted, but to the middle finger, which had been very slightly affected, and to the index, which was apparently in a normal condition. I did so because I thought that the affected fingers could thus be more comfortably kept in an extended position, than if the other fingers were left at liberty. My subsequent experience has led me to believe that I was in error on that point. It will be recollected that the index and middle fingers after being secured to the splint for several weeks, were almost as difficult to bend as the ring and little fingers.

May 21, 1874.—Important business engagements had prevented the patient from coming back to New York until the present time. I saw him to-day, and found his right hand free from deformity, the fingers being entirely straight. They can be flexed so as to meet the thumb, and to grasp objects firmly, but not to touch the palm of the hand. The patient is very much pleased with the result. He has come to make arrangements for an operation on the left hand. It was accordingly arranged that the patient should come to the city again in August for that purpose.

August 6, 1874.—The patient being under the influence of ether, I divided the palmar fascia at three points. This relieved the tension of the little finger and of the metacarpo-phalangeal articulation of the ring finger; but the articulation between the first and second phalanges of the ring finger remained rigidly bent as before, the sheath of the flexor tendon being contracted. I divided the sheath on each side of the articulation, and was then able, with some effort, to straighten the finger. I secured the fore-arm, hand, and ring and little fingers to a brass splint, adapted to their posterior surface, and mantaining extension, leaving the thumb, index and medius at liberty.

August 7.—The patient has suffered some pain, but not sufficient for him to take an anodyne, for which I had given him a prescription.

August 8.—I took off the apparatus, washed the limb, applied passive motion freely, causing considerable pain, and reapplied the apparatus.

August 22.—I took off the apparatus daily and reapplied it until the 13th of August, washing the hand and making passive motion each time, the pain gradually increasing from day to day. On the 14th of August I found so much inflammation about the articulation between the first and second phalanges of the ring finger, and the nervous system of the patient so much disordered, that I determined to leave off the splint, and from that day I have applied strips of adhesive plaster around the ring and little fingers, so as to make uniform pressure and to keep the fingers nearly straight. I have changed the than dressings daily and have made much less extensive passive motion before. The pain and swelling have greatly diminished, and the general health has improved. He is acquiring considerable use of his hand.

September 11.—As there is still a marked degree of swelling and tenderness about the articulation of the first with the second phalanx of the ring finger, I applied the actual cautery very superficially over the dorsal surface of the finger in three lines, about three quarters of an inch long and a twelfth of an inch wide, and enveloped the finger in a rag wet with cold water.

September 12.—There is a diminution of the tenderness and swelling; to-day I reapplied the adhesive plasters.

September 29.—The treatment has been continued until the present time, except that within the last forty-eight hours, the support of the adhesive plasters has been omitted at night. The patient leaves the city to-day, and I have directed the adhesive plasters to be discontin-

STRUCTURE AND FUNCTION

OF THE

UPPER END OF THE FEMUR.

BY

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In regard to the structure of the upper end of the femur, the three following propositions may be made and are susceptible of proof—that is, proper sections will demonstrate their truth.

PROPOSITION I.—The compact tissue of the inner wall of the shaft of the femur continues in the main compact up to the head of the femur.

PROPOSITION II.—The compact tissue of the anterior and outer walls of the shaft of the femur separates its plates into cancellous tissue, forming the great trochanter.

PROPOSITION III.—The compact tissue of the posterior wall of the shaft of the femur separates its plates into cancellous tissue, forming the small trochanter.

The sections are made with a fine saw in three different directions.

Direction First.—Cut off the head at right-angles to the neck, and then cut the neck and trochanters, and upper end of shaft, into slices about one-quarter of an inch in thickness. These slices will be thicker at the upper than at the lower edge. The compact tissue will be the thickest at the under side of each ring or slice, and gradually grow thinner till it reaches the upper side of the ring, that is, the upper side of the neck. At the base of the small trochanter, its most projecting point being the apex, a *few* of the plates of compact tissue will remain together, *occasionally* forming a thin firm plate or spur of compact tissue, continuous with the most central plates of the posterior wall of the shaft.

Direction Second.—Cut the head, neck, trochanters, and upper end of the shaft of the femur into four slices, beginning on the articular surface, and sawing in the longitudinal axis of the neck and shaft from above downwards. The spindle of compact tissue on the inferior side of the neck will be seen to be firm and heavy. The compact tissue on the upper side of neck will appear very thin and light. The plates of the cancellous tissue of the great trochanter will be found to converge so as to form the compact tissue of the outer and anterior walls of the shaft.

Direction Third.—Cut the head, neck, and trochanters into three or four slices in the axis of the neck, the planes of section running from before backwards, and thus being nearly at right-angles to the planes of section in direction second. The plate or spur at the base of the small trochanter will sometimes be found wanting, and will *occasionally* run a little inside of the insertion of the capsule, and in all the specimens I have examined consists only of a few non-separated plates of compact tissue, as pointed out above. This sub-trochanteric plate may sometimes be found at the base of the inter-trochanteric ridge, the outer and inner plates of which ridge speedily unite to help form the neck of the femur. And *occasionally* there is a similar plate of bone under the spiral line, or rather at the base of the spiral ridge. The outer and inner plates of the spiral ridge also speedily unite to help form the neck of the femur. And it is a singular fact, that both of these plates, sub-spiral and sub-trochanteric, whenever they exist, *are usually found wholly outside of the insertion of the capsule.*

The uniformity of result obtained by making sections of the upper end of the femur, according to the directions above given, leaves no doubt, in my mind, of the truth of the three propositions above enunciated, describing the distribution of the plates of the shaft of the femur—whether they are destined to *support* the weight of the body or *resist* the traction of muscles during the act of locomotion. The spindle of compact bone with its superincumbent arches of cancellous bone is admirably adapted to the support of the weight of the body; the small trochanter on account of its pyramidal form and basal brace, plate or spur, is well constructed to sustain the traction of the psoas and iliacus muscles; and the great trochanter is a wonderful collection of arches and braces to resist the traction of the various muscles inserted to its apex and sides. I have called the compact tissue of the under side of the neck a spindle of bone; it is a kind of pyramid of great solidity and strength. This pyramid not only supports the weight of the body, but, by its peculiar form, being broad antero-posteriorly at its base and junction with the shaft, it resists the rotation of the shaft and trochanters upon the neck, unless it be broken, and it requires great force to break it.

It sometimes happens, that the plate of compact tissue at the base of the small trochanter separates entirely into plates of cancellous tissue, and it often occurs, that the sub-spiral plate, either remains in the spiral ridge or is completely separated into plates of cancellous tissue; and it may be, that the same quantity of bone may have the same strength, whether it be compact or cancellous.

Briefly, then, the neck of the femur is so constructed as to best support the weight of the body and resist the pressure and strain of rotation, the great trochanter is so constructed as to best sustain the traction of the strong muscles constantly pulling upon it; while the small trochanter is so constructed as to best sustain the traction of the psoas and iliac muscles.

ARTHROPLASTIC OPERATION

UPON

BOTH FEMURS BELOW THE GREAT TROCHANTERS.

BY

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Attempts for the relief of anchylosed joints by forced manipulation or brisèment forcé, have engaged the attention of the surgeons of all ages, and success has followed in many cases in which the contracted condition of the member depended on rigidity of the capsular, aponeurotic and ligamentous investments of the joint, and on contraction of the muscles surrounding it. Tenotomy and myotomy, the offspring of the genius of Strohmeyer, of Hanover, of late date, however, have given a far greater scope to orthopædic surgery in remedying deformities of this character. The boon of anæsthesia by chloroform and ether next bereft brisèment of its terror in the mind of the patient.

Yet as true anchylosis or bony union of the articulatory facets naturally offered difficulties which manipulatory and forced movements failed to overcome, it was through the ingenuity of the late American surgeon, John Rhea Barton, of Philadelphia, who first, in 1826, entertained the happy thought of meeting these obstacles by division of the femur through the trochanter and a part of the neck transversely, in a case of rectangular anchylosis of the hip-joint, and put the plan successfully into execution. The most substantial and enduring progress was thus made in the treatment of the deformity under consideration.

I have tried to inform myself of the literature pertaining to this specialty, but have been able to find only a few cases in surgical works and periodicals touching upon it.

In Prof. S. D. Gross' work on Surgery, vol. 1, pp. 1044-5, there is found, in addition to a description of the operation of Barton for anchylosis of the hip-joint, a record of ten cases of operations, not arthroplastic however, performed upon a similar principle for anchylosis of the knee. Of the ten cases, eight recovered and two died. The operation consisted in the excision of a wedge-shaped section of bone from the femur, above the condyles, and was first performed by Gibson in 1838. Dr. J. Kearney Rodgers modified the operation by uniting the ends of the bone with silver wire. In one case, Dr. Buck of New York performed the excision through the patella. In 1859, Prof. Pancoast perforated the femur at half a dozen points just above the knee with a stout gimlet, subcutaneously through a single opening, and then forcibly broke the bone. In 1860, Dr. Brainard divided the femur through its condyles, by means of a perforator. In one case mentioned, the patella was detached subcutaneously from the femur and tibia, and excellent motion resulted. In one case, Prof. Gross obtained an excellent cure, after separating the tibia and patella from the femur by means of perforators and levers constructed for the purpose.

The results of these various procedures have been excellent, all of the patients, with the exception of two of those operated upon after the method of Barton, having recovered with serviceable limbs.

In 1869, Prof. L. A. Sayre, reported two cases of operations for osseous anchylosis of the hip which resulted in the establishment of artificial joints. In the same year, Dr. Wm. Adams, of London, gave a report of four cases which were successfully operated upon by subcutaneous division of the neck of the femur for bony anchylosis. I have been informed also that Dr. Morton of Philadelphia, has lately been successful in the formation of an artificial hip-joint.

In a patient, aet. 14, with anchylosis of the knee-joint, Dr. L. S. Little of London, succeeded in restoring motion by means of a carpenter's chisel used subcutaneously, power of locomotion returning in three weeks.

In this connection, the happy result of excision of the condyle of the inferior maxillary bone for anchylosis of the temporo-maxillary articulation, by Dr. James L. Little, of New York, in 1874, deserves mention, as well as the case of successful osteotomy by exsection of a wedge-shaped portion of the lower jaw, with the base pointing downwards, for complete anchylosis resulting in the train of scarlet fever. Vide *Boston Medical and Surgical Journal*, October 3, 1872.

These are, as far as I have been able to ascertain, the only cases, operated upon for the relief of deformity resulting from bony anchylosis. I should regret to be uninformed of the success of other surgeons in similar cases.

In 1858, the first case of true bony anchylosis of the hip-joint which I had the opportunity and satisfaction to relieve, by removal of a section of the trochanter major, presented itself to me in the person of a young lady, who, although of very delicate health, made a rapid recovery. The report of her case is embodied in the *Journal of Medical Sciences*, of Philadelphia, April, 1858, p. 354.

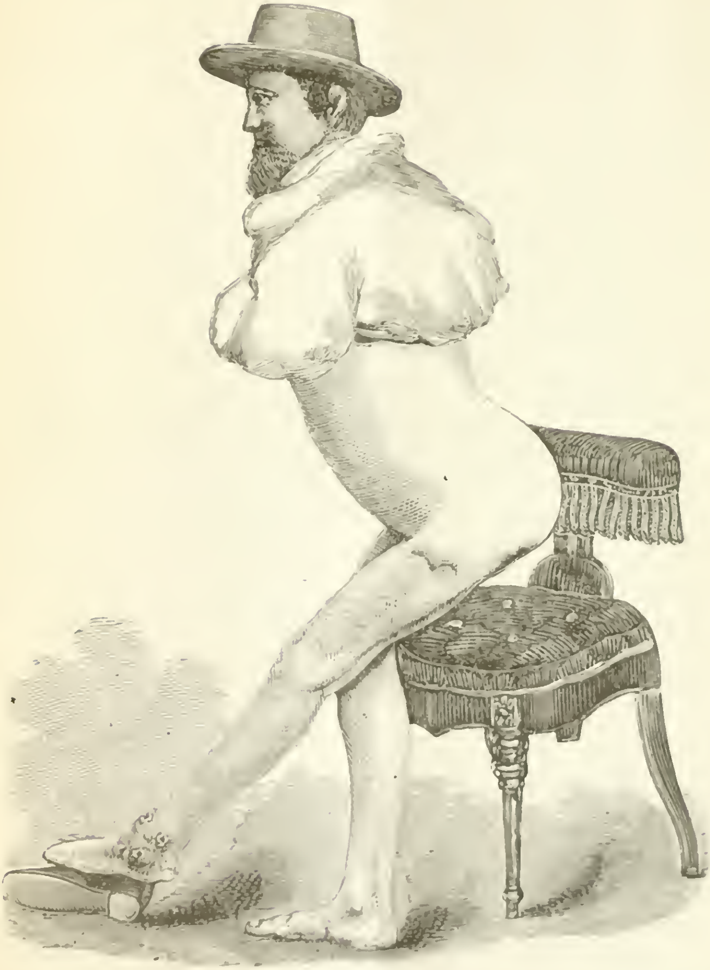
The case narrated below offers no more special interest than previous successful attempts at relief in the hands of other surgeons. Yet as both hip-joints, firmly anchylosed with both femora immovably adducted by structural contraction of the adductor and tensor vaginæ femoris muscles—the patient having never walked before—were successfully operated upon, in addition to resection of one of the ankle-joints for caries The record of the case, embodying the formation of three new artificial joints in one person is worthy of being laid before the professional reader.

The patient, Wm. Evans, of New Brighton, Beaver County, Pa., aet. 31, of English parentage but an American by birth, first came under my observation in January, 1875, for caries of the left ankle-joint of traumatic origin. I exsected the articulation and the patient made a good and rapid recovery, the result of the operation being highly satisfactory.

During early childhood the patient had suffered from double morbus coxarius, which resulted in true anchylosis of one hip when he was in his sixth year, and of the other when in his tenth.

The femurs were fixed almost at right angles with the pelvis, one being somewhat in advance of the other; the lumbar vertebræ were greatly curved forward to compensate for the direction of the lower extremities and thus approximate the axis of trunk to that of the latter; the trochanters were very prominent, and the knees were in close apposition, the right one extending obliquely in front of the left.

The patient when he came under my care had a vigorous constitution and well developed body, which, no doubt, resulted from his having been inured to toil in the open air from his youth. He had obtained a livelihood by driving a coal wagon and shoveling coal, at which employment he was considered as efficient as any able-bodied man, despite the hindrance that during locomotion he was necessitated to rely entirely upon the use of crutches.



Anchylosis Vera of Both Hip Joints—Formation of Artificial Joints.

The excision of the left ankle-joint having been followed in a comparatively brief period by the formation of a useful, movable and shapely artificial joint, the patient required no persuasion to undergo operative measures with the view of placing his limbs in a more becoming and useful position.

With the cordial approbation of the patient, therefore, on July 18, 1875, I decided to operate upon the left femur with the view of straightening the limb and forming an artificial joint below the trochanter major.

The patient having been anæsthetized with ether and chloroform, I made a semicircular incision around the upper margin of the great trochanter, and formed a large flap of skin and cellular tissue, which was detached and reflected downwards. The bone was then exposed immediately below the trochanter by severing the fascia and muscles attached to it, and, after the periosteum had been detached, a chain-saw was passed around the bone and it was cut through. A **V**-shaped piece was then sawed from the end of the shaft, the base of the wedge being directed backwards. The margin of the extremity of the shaft was then clipped off and rounded somewhat with bone-nippers, in order to accommodate it to the under surface of the trochanter, the cancellous tissue of which was hollowed out slightly to receive it. The limb was then extended naturally without difficulty, and the rounded extremity of the shaft fitted into the concavity formed upon the under surface of the trochanter and superior extremity of the femur. The wound was dressed with carbolized oil; a drainage tube was inserted at the base of the flap and the ends were brought out at the angles of the wound; after which the flap of skin was replaced in position and united to the surrounding integument by several iron-wire sutures. The part was covered with a carbolized linseed meal poultice, and the limb was extended and fastened to the foot of the bed. There was very little bleeding during the operation, and only two small vessels required ligation. An anodyne was then ordered.

The operation was performed in my private hospital, and was witnessed by Drs. Gilliford and Wallace, who assisted.

Some reaction followed the operation, but it proved unimportant and disappeared in a few days under the use of tincture of digitalis, quinia and morphia. About three days after the operation, the hip was attacked with erysipelas of a mild form, which disappeared in about a week, under applications of tincture of iodine. Some discomfort was experienced by the patient owing to his decubitus, which now, of necessity, was upon his back, with the right lower limb extending up above the level of the bed at an angle of 45°; the left one, which had been subjected to the operation, being supported by long leather splints, and secured to the foot-board of the bed. The unnatural curvature of the spine added greatly to the discomfort of this position. The right limb was rendered more comfortable by its being suspended from above, by means of a sling around the ankle.

A few days after the operation the limb operated upon was extended upon a long sheet-iron splint reaching from the fold of the nates to the heel, with a foot-board which was fastened by straps to the foot of the bed. Long lateral hose-leather splints, braced by sheet-iron ones, were also applied, with the view of gradually overcoming the knock-knee with which the limb was affected, the knee having hitherto been in close apposition with its fellow of the opposite side, while the feet were widely separated. These appliances were retained by roller bandages.

Very free suppuration occurred, and continued for two or three weeks, but on August 15th, the drainage tube was removed as being of no further use, the discharge having almost ceased. At this date, a bed-sore formed over the sacrum, and proved a source of much annoyance. It finally healed, only, when the spine became sufficiently straightened to enable the patient to recline in the prone position.

On August 22nd, just five weeks after the operation, the wound made upon that occasion had entirely healed.

After the subsidence of the primary inflammation, which occurred during the first week following the operation, passive motion was kept up at the seat of exsection, by gently flexing the thigh towards the abdomen once a-day. This was practised without discomfort to the patient, as but slight flexion was made, in consequence of a dread of producing dislocation of the shaft.

Eight weeks after the operation, the patient had completely recovered. He was in perfect health despite his confinement. The wound had been cicatrized for three weeks. The limb was movable in all directions, and the new hip-joint appeared to be perfect. The patient could move the muscles of the thigh and bear considerable weight upon the limb, by pressure against the foot of the bed, without pain. The limb was about six inches longer than its fellow, and nearly straight, the knock-kneed condition having been considerably lessened. The spine was much straighter, and the trochanter less prominent. The patient was in good spirits, and ready to undergo an operation upon the other limb.

On September 19th, 1875, I performed an operation upon the right femur similar to that which I had done upon the left nine weeks previously.

The patient having been chloroformed, the bone was exposed in the same manner as in the former operation, and a chain-saw was passed around it after some effort, this being the most difficult procedure in the operation. It was accomplished by passing a flexible probe, carrying a ligature around the bone, when the chain-saw was attached and drawn into the desired position. It was then worked through the bone, immediately beneath the greater trochanter, but the division of the bone was extremely tedious on account of its being of the density of ivory. A triangular section, with its base posteriorly, was then sawed from the extremity of the shaft, which was then rounded off with bone-nippers, in order that it might fit into a concavity which was gouged out from the under surface of the superior extremity of the bone and greater trochanter for its reception. The limb was then extended, but owing to the rigidity of the adductor muscles, it was impossible to keep the osseous surfaces in apposition while the limb was extended completely. I therefore divided the adductors longus and brevis subcutaneously in the groin, when no further difficulty was experienced in bringing the limb into the desired position with the osseous surfaces directly opposed. A drainage tube was then placed in the wound; carbolized oil was applied to the latter, and the flap was returned to its natural position and united to the surrounding integument by a number of iron-wire sutures. There was very little bleeding during the operation, and no ligatures were necessary.

I was assisted during the operation by Drs. Cable, Wallace and Sweet.

A poultice having been applied over the joint, the limb was placed upon the long extension splint, before described, with extension by means of tapes secured to the limb above the knee and ankles, and fastened beneath the foot-board; the new joint was braced by hose-leather splints, and the whole apparatus was then secured by bandages.

An anodyne was administered after the patient was placed in bed.

Some fever with anorexia followed, but it was decidedly less marked than after the first operation, and disappeared entirely in the course of a week. Free suppuration occurred, but at the expiration of two weeks the discharge had almost ceased. I attribute this comparative freedom from fever and early cessation of suppuration to the improved general condition of the patient, who during the periods of convalescence, after the two previous operations, had been denied the use of stimulants. Prior to the excision of the ankle-joint he had been accustomed to habits of intemperance.

Two weeks after the operation all of the functions were performed normally and the patient was free from fever and had comparatively little pain. He had lost in weight and color but he felt well and cheerful. There was very little suppuration and the wound had healed except at the angles through which the drainage-tube passed. Both limbs were flexed daily to an angle of 45° with the abdomen.

Four weeks after the operation, the patient sat up in bed several hours daily, his back being supported. All of the iron-wire sutures were removed, as was also the drainage tube. The curvature of the spine had greatly decreased and the patient reclined in a perfectly straight position with comfort. His general condition was excellent.

A noticeable feature of the case, at this time, was the sudden lengthening of the left limb, which now exceeded the other one a half inch, whereas, owing to the resection of the ankle-joint it should have been to an appreciable extent the shorter of the two. This change was first observed immediately after the patient had complained of straining the hip while making efforts to lift himself during defæcation. Conjointly with this were observed stiffening of the hip-joint; undue prominence of the trochanter; glandular enlargement with pain in the groin; and the bulging upwards and forwards of the extremity of the shaft below the inferior plane of the pelvis.

From these changes it was evident that a luxation of the shaft had occurred, and that the upper end rested in all probability upon the tuberosity of the ischium, I decided therefore to manipulate the limb with the view of returning the bone to its proper position.

On October 24th, chloroform being administered by Dr. Wallace, I passed a broad band around the thigh near the groin and gave it in charge of an assistant, who made outward traction, while at the same time he steadied the ilium with the palm of his hand. By gradual but forced flexion the femur was brought upwards with an audible snap when free motion was again restored, the extremity of the shaft having returned to its new socket upon the trochanter. The limb could now be crossed over its fellow and fully abducted and flexed, while by measurement it was found to be somewhat shorter than the other.

The limb was then redressed and placed upon the extension splint in the same manner as before, but in order to prevent a recurrence of the dislocation two sheet-iron splints were applied along the lateral faces of the limb, the external one reaching from the crest of the ilium to below the knee, and the internal one from the groin to the knee; the splints were retained in position by straps, and when these were buckled together the bone was held firmly in position.

Upon the day following the reduction of the luxation there was considerable reaction, *i. e.*, pyrexia, thirst, anorexia, and pain in the hip. The hip became greatly swollen and discolored, and two days later a ragged opening formed above and behind the trochanter and discharged about a gill of thin, bloody and very offensive matter.

Several ounces of dirty pus were discharged daily from the opening above the trochanter, notwithstanding that it was frequently syringed out with solutions of carbolic acid and permanganate of potassa. The constitutional irritation passed off in a few days, and it was not long until the suppuration assumed a more healthy appearance and gradually diminished. The hip-joints remained freely movable and the limbs were flexed towards the abdomen daily.

Six weeks after the reduction of the luxation both hips were apparently well, the right hip having healed in less than seven weeks after the formation of the artificial joint. Notwithstanding, however, that the left limb was flexed towards the abdomen frequently, and that the patient sat up perpendicularly in bed for several hours daily, the left hip became stiff and immovable. The fact that flexion of the limb could be produced while the extremity of the shaft remained immovable was found to be due to the existence of free motion between the ossa innominata and sacrum, which by sliding upon each other counterfeited motion in the new joint. The ability of the patient to sit up in bed while the hip-joint remained stationary was attributed to this freedom of motion between the innominate bones in conjunction with great mobility in the lumbo-sacral articulation. It became necessary therefore to break up the adhesions which had formed, and I did so on December 5th, while the patient was under the influence of ether. Thereafter the limb was flexed daily as before, the precaution however being taken of having the pelvis held immovable during the manipulations.

Considerable inflammation of the cellular tissue ensued upon the forcible breaking up of the adhesions, and suppuration followed and continued in a limited degree for several weeks.

Later, the forced flexion of the left limb caused the patient to have nervous chills followed by fever, and as a consequence it became necessary to lessen the extent of the manipulations. A cord and pulley was therefore fastened over the bed, and with this arrangement the patient was able to flex the limbs himself and keep up motion in the joints.

During January, 1876, the patient became able, by using the flexor muscles, to lift the limbs, heavily encased as they were with iron splints, a foot from the level of the bed.

On February 13th, the splints were removed and the patient was placed upon his feet on the floor, when, supported by crutches, he was able to bear his weight upon his limbs and stand erect, the curvature of the spine having become normal.

A week later, the patient dressed himself without assistance, got out of bed and walked about the ward, merely steadying himself with crutches. He was able also to sit comfortably upon a chair.

He gradually gained control over his limbs, and in March walked around the hospital and became able to dance, merely supporting himself by his hands on the back of a chair. He walked slowly but without discomfort, always steadying himself with crutches to avoid falling.

Each day the patient improved in his walking, but he was hindered to some extent by inability to sufficiently separate the thighs and by a want of sufficient mobility of the hips, which compelled him to take very short steps.

At his own request, therefore, April 2nd, he was again chloroformed and the limbs were forcibly flexed to a right angle with the pelvis, then widely abducted, and then crossed over each other. These movements resulted in complete liberation of the joints.

After this operation, the patient was again confined to bed and the joints inflamed and suppurated freely, but the suppuration gradually diminished. The knees were kept separated by an apparatus which consisted of two cushioned curved plates connected by a screw, the extremities of the latter being secured to the centres of the plates. The plates were applied to the inner surfaces of the knees and secured by two straps encircling the limbs, one passing above and the other below each knee. By means of the screw connecting the plates, the limbs could be separated or drawn together as desired. The apparatus answered the purpose admirably.

The condition of the patient, June 15th, 1876, is very favorable. He is able to get out of bed without assistance and can stand upon his feet, and walk upon crutches better than ever. But for the last forcible flexion of his limbs, which was made with the view of securing still greater mobility in the new hip-joints, yet was followed by inflammatory reaction to a greater extent than was desired, the patient would have recovered the use of his limbs much sooner. There is no doubt, however, that he will walk in due time with ease and comfort and enjoy control of his limbs in locomotion, to which he has since infancy been a stranger. It is hoped to, that by attention and watchfulness on his part to keep the new joints freely movable ever afterwards, subsequent anchylosis will be prevented. Should this, however, eventually take place, as happened in the case of John Rhea Barton, six years after, no material detriment will accrue to my patient : for there is preternatural mobility of the pelvic bones in this case, which exists not only between the sacral and lumbar vertebræ, but also between the sacrum and iliac bones, and between the ossa pubis, verifying a beautiful provision of nature, by which the patient was enabled to locomote on crutches, notwithstanding the contracted condition of his limbs.

The accompanying photograph was executed when the patient presented himself for treatment, and fairly represents his condition at that time.

In concluding this report, it gives me pleasure to acknowledge the material aid which I received from my assistant, Dr. Wm. Wallace, both in the close and faithful attendance on the case and in the preparation of this paper.

EXCISION OF UMBILICUS FOR MALIGNANT DISEASES.

BY

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Although cancer is comparatively a common disease, and has been known to invade almost every tissue of the organism, there are some situations where it is rarely found; of these, the umbilicus is a good example. Walshe, (*Nature and Treatment of Cancer, London, 1846, p. 92,*) speaking of the researches of Tanchou, says: "The Mortuary Registers of Paris and two adjacent arrondissements furnished, between 1830 and 1840 (both inclusive) 9,118 deaths from cancer." Of these, there were but two instances in which the umbilicus was the seat of the affection. In the course of my professional career, I have met with three such cases. The first of these occurred in 1840, in a lady, aged 76, and went on to the usual termination. At the autopsy, the feasibility of an operation for the removal of the diseased mass, when occupying such a position, struck me forcibly, and I saw no reason why a favorable result might not be anticipated, especially were the patient's general condition good.

The second case occurred in 1853, in consultation with Dr. Joseph Worster, of this city. The patient was a boy, aged two years and five months, of healthy Irish parents, and with no trace of malignant taint in the family. Soon after the birth of the child, the parents noticed that the navel did not heal. Upon examination there was discovered a hard mass occupying the connection of the cord with the abdominal walls; and to the right of the cord, a naked, non-cicatrized surface, discharging a thin sanious fluid. Various methods of treatment were resorted to, but without success. The spot failed to cicatrize, and the tumor increased in size.

When the boy was three years of age, an attempt was made to excise the mass, but as it was found to extend into the abdominal cavity, only the outer portion was removed. Fifteen months later, although the lad's general condition was good, the tumor had become harder and firmer, and was rapidly increasing in size. I accordingly advised the immediate and complete removal, and the consent of the parents having been obtained, I proceeded to operate on November 30, 1853, assisted by Drs. Joseph Worster, Robert Watts, and others. The patient having been brought under the influence of chloroform, two elliptical incisions, each three inches long, which included the diseased mass, were made; and the dissection carried carefully down to the linea alba, care being taken to confine the incisions to healthy structures. This point having been reached, the linea alba was cut through, and I proceeded to cut upon either side on a director, so as to include the whole of the tumor. To accomplish this, it was necessary to enter the abdominal cavity, and here some embarrassment was occasioned by the protrusion of the intestines. These were held aside by an assistant, and no further difficulty was experienced. The opening made in the abdominal walls was about three inches long, by one and a-half in breadth. The parts were now thoroughly cleansed, and the wound closed by introducing deeply, but at the same time avoiding the peritoneum, three hare-lip pins, and securing them by twisted figure of **8** sutures. The line of incision was closed with fine interrupted sutures, and the whole secured by means of adhesive straps, a compress, and over all a soft wide bandage. The patient was now placed upon a milk diet, and opium was ordered in quantities large enough to relieve all uneasiness.

December 1.—Patient has been very quiet; seems to be doing exceedingly well. Bowels moved without assistance, and the abdomen is flat.

December 4.—The dressing was removed to-day, and satisfactory union found throughout the wound; upon which, the pin sutures were removed and simple dressing applied.

From this time the little fellow made excellent progress, and in a few weeks was entirely well. Dr. Worster was summoned to attend him for a broken leg, nearly two years later, and reported no signs of the return of the disease.

The tumor was examined microscopically by Dr. Alonzo Clark, and pronounced to be undoubtedly cancerous.

The third and last case of malignant disease of the umbilicus, that has come under my observation, occured in the year 1865. The patient was a thin, cachectic lady, aged 37, who bore no testimony of cancerous taint in the family. Upon examination of the umbilicus, I discovered a hard mass about the size of a hen's egg. This, she said, had been growing quite rapidly; and at times was exceedingly painful, especially when she attempted to perform any duty that would necessitate a contraction of the abdominal wall.

I advised an operation, which the patient at once refused to have performed. She left my office, and I have not since seen her.

HOSPITAL RECORDS.

ROOSEVELT HOSPITAL, NEW YORK.

Reported by GEORGE E. TWISS, M. D.

Exsection of Knee-Joint, (Service of Dr. E. Mason,) February 16, 1876.—Female, aet. 22; of good general health; entered hospital with two sinuses communicating with knee-joint, fluctuation and relaxation of the ligaments around the joint, and subluxation of the tibia backwards. Ether administered, Esmarch's bandage applied, and a curved incision with the concavity upwards was then made from the external to the internal condyle. The flap was dissected up and the articular surfaces of the femur and tibia removed with a saw, the patella being dissected out. The joint surfaces were roughened and spongy, and the cavity was filled with a gelatinous substance. The ends of the bones were wired together, the limb being extended. The flap was held in place by silk sutures, space being left at each angle for drainage. A posterior wooden splint and lateral iron brackets, held in place by plaster bandage, were then applied; and the joint tightly bound with mosquito netting. March 29, union firm.

Exsection of Hip-Joint, (Service of Dr. E. Mason,) April 3, 1876.—J. M., aet. 12, had hip disease for two years. The femur was flexed at a right angle with the pelvis, and there were several sinuses communicating with the acetabulum. An incision was made over the great trochanter, and the head of the bone disarticulated and removed by a chain saw. The acetabulum, which was the principal seat of the trouble, was thoroughly scraped. Hemorrhage slight. Buck's extension apparatus was applied and the patient did well for a few days, when he began to run down. Albumen appeared in the urine, and he became delirious and died on the seventeenth day.

Exsection of Knee Joint, (Service of Dr. E. Mason,) April 14, 1876.—Female, aet. 19. Gives history of trouble in right knee extending through last seven years. Two months ago she had a fall, and since then has lost use of the limb. There is subluxation of the tibia backwards and outwards, and distinct crepitation on moving the joint. The operation and subsequent treatment were exactly similar to that above described, and there was firm union on May 27.

Amputation at Hip-Joint, (Service of Dr. E. Mason,) April 20, 1876.—Male, aet. 18, with the right leg much distorted and useless, owing to paralysis for fifteen years and injuries which it had sustained during that time. He came to hospital to have the encumbrance removed. Ether was administered and the tourniquet applied to the abdominal aorta. Esmarch's bandage was carried to a point just below that where section was made, and allowed to remain on. A circular incision was then made at the highest thigh-amputation, and the tissues divided down to the bone, and then dissected up until the joint was reached and the head of the bone disarticulated. The patient lost about four ounces of blood, principally from the femoral vein. The flaps were brought together with four sutures and supported by straps of adhesive plaster. The wound was washed daily with an antiseptic solution. The patient had no disagreeable symptoms; and at date of reporting, the stump is entirely healed.

Recurrent Naso-Pharyngeal Polypus—Removal by Galvano-Cautery, (Service of Dr. H. B. Sands,) May 17, 1876.—W. H. A., aet. 15. In December, 1875, Dr. S., exsected the superior maxilla and removed with the galvano-cautery, a tumor about the size of a hickory nut, which was attached to the basilar process of the occipital bone; and the patient left hospital apparently cured. Latterly the symptoms have returned, and upon examination a tumor about two inches long, and having a granulation appearance, was discovered on the seat of the old trouble, extending forwards to the great wing of the sphenoid, and downwards to the level of the hard palate. The patient was etherized, the lateral attachments divided by the galvano-caustic knife, the tumor drawn up and its pedicle divided with a straight probe-pointed bistoury. The remainder was removed with mouse-tooth forceps and scissors. The hemorrhage was moderate and easily controlled by pressure and ice. On May 25, the patient left the hospital cured.

Exsection of Elbow, (Service of Dr. E. Mason,) May 23, 1876.—T. M., aet. 6½. Four years ago right elbow was injured by a blow. About a month since he was again struck in the same place and the articulation became inflamed and suppurated, causing considerable deformity. The patient was etherized, Esmarch's bandage applied, and the joint having been opened on its posterior aspect, was found to be disorganized. The condyles of the humurus, the olecranon process, and the head of the radius were removed with cutting pliers. Hemorrhage slight. Wound brought together, and bandage and anterior gutta percha splint applied. No bad symptoms. Patient progressing favorably.

Perineal Section, (Service of Dr. R. F. Weir,) May 23, 1876.—Patient, aet. 37, with stricture at bulbo-membranous portion of urethra and a small perineal abscess. Thompson's probe-pointed catheter was used as a guide. Patient etherized and perineal section performed in the usual way. No constitutional disturbance. Patient doing well.

Post-Rectal Fibro-Cystic Tumor, (Service of Dr. T. M. Markoe,) May 29, 1876.—J. C., male, aet. 40, had from childhood been troubled with a tumor within the pelvis, which interfered with defecation. Of late years there has been more or less suppuration, but no fecal matter has been discharged through it. Examination per rectum revealed a flask-shaped tumor about the size of an egg, attached to the sacrum in right ischio-rectal fossa. An incision was made from the coccyx downwards for about two inches, the tumor enucleated and its pedicle divided. The operation laid bare the posterior wall of the rectum. Hemorrhage slight. Wound healed nicely.

Removal of Clitoris and Left Labium Majus for Hypertrophy, (Service of Dr. R. Watts,) June 7, 1876.—A M., aet. 17. For the last year patient has noticed that the clitoris and left labium have grown larger; the former measuring about an inch in diameter, the latter being a tumor about four inches long by one and a-half wide and deep. Lately the patient has had vaginismus. She was etherized and the clitoris and labium were successively surrounded by the galvano-caustic wire and removed. After the operation the wound was dressed with cold water, and subsequently with charcoal poultices. The patient left her bed about ten days after the operation. The ulcers have entirely healed.

Amputation at Hip-Joint, (Service of Dr. E. Mason,) June 17, 1876.—S. S., female, aet. 50. On March 7th had an enchondromatous growth involving the left femur removed by Dr. Mason, which was afterwards decided by Dr. Delafield to be malignant. As the patient was running down rapidly and the wound was sloughy, it was determined to remove the limb. The operation was performed in a manner similar to that described above. The patient did well until the third day, when peritonitis developed. It was supposed to be due to the pressure of the tourniquet which had been used during the operation, and disappeared under appropriate treatment. The ligatures have now come away and the wound is healing rapidly.

Amputation of Thigh, (Service of Dr. R. F. Weir,) June 22, 1876.—C. M., male, aet. 24. This was a case in which Dr. Mason ligated the femoral of the left side for popliteal aneurism, and in which the sac subsequently suppurated. Lateral skin flaps were made. The wound was treated by the open method, and is healing rapidly.

Simultaneous Ligation of Carotid and Subclavian Arteries of Right Side for Aneurism of the Innominate, (Service of Dr. R. F. Weir,) June 22, 1876.—R. P., male, aet. 45, had for some time been effected with dyspnœa, cough, and loss of voice, and was also cognizant of a pulsation in the neck on the right side. Upon examination aneurism of the innominate was diagnosticated. On June 20th, the patient had so bad an attack of dyspnœa, that tracheotomy was performed by Dr. J. W. Rice, the House Surgeon, and with great relief. On the 22d, the carotid was ligated above the omo-hyoid, and the subclavian in its third portion, carbolized catgut being used. The patient did well until the fifteenth day, when the aneurism burst into the trachea, and caused instant death. *Autopsy.*—Aneurism of the innominate with dilatation of the aorta. The arteries which had been operated upon were completely plugged, and there were no traces of the ligatures.

External Urethrotomy, (Service of Dr. R. F. Weir,) June 27, 1876.—P. S., aet. 42. In January the patient had a sinus at the peno-scrotal angle, the result of abscess caused by stricture; for which Dr. Sands performed external urethrotomy, but with a negative result. Ether was administered, and a staff having been introduced, an incision was made to it through the sinus. A stricture was found at this point and divided. Hemorrhage free but controlled by pressure. The parts have now healed for the second time, with the exception of the sinus.

PENNSYLVANIA HOSPITAL, PHILADELPHIA.

Reported by JOHN B. ROBERTS, M. D., Resident Surgeon.

Extraction of Cataract—Simple and Effective Mode of Dressing, (Service of Dr. R. J. Levis.)—A man with senile cataract, who had lost one eye after the operation of displacement, in another city, was admitted for extraction. After the pupil had been fully dilated, a curvilinear incision was made just within the upper edge of the cornea; through this incision the iris was drawn by means of a hook and iridectomy done. Pressure backwards was then made with the edge of the scoop on the lower part of the cornea, to push the inferior edge of the lens back, and thus cause it to present its upper edge to the corneal incision. By continued pressure upawrds the lens was then "coaxed" out. If it had not escaped readily Levis' wire loops would have been introduced, which, by imbedding itself in the substance of the lens, makes a better traction instrument than the scoop.

The following very simple dressing was then applied, two or three semi-circles of black silk plaster was cut and placed with the curved edge upwards upon the closed upper lid. By this means the eyelid is stiffened, and acts like a pasteboard splint to the wounded cornea: for the eye cannot be opened unless the lid is creased, which is impossible after being made inflexible by several layers of plaster. This dressing is cooler than the mass of cotton usually placed in the orbital depression, and allows free drainage of secretions from under the lid, so precluding the occurrence of active conjunctivitis; while by a little dexterity, atropia can be instilled into the eye without removing the dressing. If the semi-circles do not close the eye firmly enough, a long strip can be superimposed obliquely across the eye, from forehead to cheek.

When the patient was discharged, there was still a fragment of undissolved capsule in the area of the pupil; and he had not been tested for lenses.

Græfe's operation is generally employed, because, unless the lens is very hard, a portion of the cortical substance is apt to be scraped off in Liebreich's method when no iridectomy is done; and in the latter operation there seems to be a greater tendency to the occurrence of synechiæ.

Pirogoff's Amputation at the Ankle, (Service of Dr. William Hunt. — An old man, who had been admitted with crushed foot, was subjected, after a trial for some time of conservatism, to amputation at the ankle. An incision was made from the point of one malleolus around the sole of the foot to the other, and inclined somewhat obliquely forwards in order to give abundant arterial supply to the parts. Then a second curved incision was made across the top of the foot, joining the ends of the first incision and opening the ankle joint. The ligamentous attachments of the astragalus were divided, and the saw applied from above to the os calcis, which was cut obliquely downwards and forwards. Finally the malleoli and a thin piece of the tibia were sawn off, and the parts brought into apposition by sutures and adhesive straps.

Pirogoff's method of amputating at the ankle is very popular in this hospital, and is frequently performed. One of the messengers of the hospital sustained an amputation of this kind several years ago, and is now exceedingly active; having a slight limp when he walks, but being perfectly able to do any ordinary service.

UNIVERSITY HOSPITAL, BALTIMORE.

Reported by T. A. ASHBY, M. D., Resident Physician.

Epithelioma of Cervix—Removal.—Sarah L., aet. 30, was admitted into the University Hospital, for hemorrhage of the womb. Vaginal examination revealed an epithelioma of the cervix. The vagina was temporarily tamponed with cotton saturated with sol. subsulph. of iron, and hemorrhage arrested.

On the third day the patient was anæsthetized, and placed upon the table for operation. The entire growth was removed above the vaginal reflexion by use of serrated scissors. Bleeding was profuse and alarming, but was finally controlled by use of Monsel's sol. one-half strength applied on cotton, and the vagina tamponed with wet cotton. Patient rallied under the free use of stimulants, though weak and anæmic from great loss of blood previous to and during the operation. On the third day after the operation, pelvic cellulities set in, but was controlled by free use of quinine and morphia. Patient recovered after a lingering illness, and was discharged from the hospital cured—promising to return if there was ever a relapse of her trouble.

Epithelioma of the Tongue—Removal.—A. S., male, aet. 50, engraver by profession, admitted into hospital on December 14th. First discovered an ulcer on right side of his tongue twelve months previous to date of admittance, which continued to increase until it became large, ragged, and bleeding, involving nearly one-half of the organ. Operation was at once determined upon, and the entire half of the tongue removed by use of the écraseur. The patient not anæsthetized. Hemorrhage was arrested by direct application of the actual cautery. Patient lost comparatively little blood. On the seventh day after the operation secondary hemorrhage came on; ice applied and flow ceased. On the eighth day bleeding recurred; subsulph.

iron applied, but hemorrhage checked only temporarily. The actual cautery was again applied, and the part well singed. Bleeding ceased and patient recovered in course of two weeks. No evidence as yet of return of the disease.

Use of Drainage Tubes in the Treatment of Amputation of the Breast.—Five cases of amputation of the breast for scirrhus cancer have been recorded in this hospital since June of 1875. Of these cases, four were of the right mamma, one of the left. In three cases, the tumor was removed and the wound brought together by wire sutures, and allowed to heal by first intention, small pledgets of lint being placed at the most dependent part to allow drainage. There was much sloughing, and in only one case did the wound unite by first intention. In the two remaining cases, after removal of the entire breast and tumor, every vessel ligated and all oozing ceasing, the surfaces were allowed to glaze, and a small elastic tube, perforated every half inch with eyelet holes, was laid along the floor of the wound, and the flaps drawn over the tubing were united by wire sutures.

Each day a current of carbolized water was passed through the tubing by use of a syringe, and all decomposing matter removed. Pus was drained away freely. The flaps united at once by first intention, and as soon as all drainage ceased the tube was withdrawn. Each patient recovered within three weeks from date of operation. There is no comparison as to the good results of this plan over the other.

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ANALYTICAL AND CRITICAL REVIEWS.

Syphilitic Lesions of the Osseous System in Infants and Young Children. By R. W. Taylor, M. D., 8vo., pp. 179. Wm. Wood & Co., New York.

This volume embraces the histories of twelve cases of infantile bone syphilis observed by the author, and a synopsis of about fifty others heretofore scattered through the various periodicals. After carefully analyzing these cases, the author believes that syphilitic bone lesions in children are generally hereditary. He does not discuss the influence of a syphilitic father, but observes that the lesions occur when the mother has been inoculated within two years of the birth of the child. The form usually taken is that of a tumor, which is composed of cells and calcareous matter, and may attain the size of an inch in diameter. The seat of the affection is generally the diaphyso-epiphysial junction at the distal extremity of the long bones, though any part of the osseous system may be involved. The tumors rise abruptly from the bones, being smooth and globular; in some cases forming a ring, in others the epiphysis is enlarged. The integument over these tumors is movable. As a rule, several bones are affected simultaneously and symmetrically. The lesions appear soon after birth and complete their development in from two to six weeks. They either remain chronic or are absorbed, leaving depressions, or they may degenerate and cause suppuration. Several chapters are devoted to differential diagnosis. That from rickets is the most important and may be briefly capitulated: *Syphilitic bone affections* appear soon after birth; are associated with other syphilitic manifestations; rarely involve the skull and ribs conjointly; if on the skull, they form nodes on the parietal and frontal bones; are few and irregular on ribs; the fontanelles close at normal time; and no deformity is left. *Rickets* is seldom noticed before the sixth month; has a prodromal cachexia; generally affects skull and ribs; there is cranial tabes of occiput; the extremities of all the ribs are symmetrically enlarged; the closing of the fontanelles is delayed; and bowing and distortion of the bones is a sequel. The author has found the mixed treatment to be particularly applicable to these cases.

The volume is as valuable as it is unique. Coming from one whom we have learned to recognize as an authority in this important department, and giving evidence of such deep research and careful clinical observation, it well deserves the foremost rank in the literature of the subject. The volume presents a handsome appearance, and on the whole, it is one of which the profession may well be proud.

An Elementary Treatise upon the Diseases of the Skin, for the Use of Students and Practitioners. By Henry G. Piffard, A. M., M. D., 8vo., pp. 375. New York and London, 1876.—Macmillan & Co.

This work is peculiarly practical in purpose and elementary in scope. The author designs it to be a hand-book to the student attending lectures, and a guide to supply the place, in the hands of the general practitioner, of larger treatises. We therefore find that he has aimed chiefly at the discussion of practical points, avoiding theories as far as possible. While containing the results of his own labors, we find in the various chapters the views of classic authors clearly and tersely given; the result is to present many portions of his subject in a very acceptable manner. The early chapters of the book are devoted to the rudiments of dermatology and we commend them as being both simple and practical. They certainly will be of much assistance to those who begin the study of skin diseases by a perusal of this book. Indeed, it is evident that the aim of the author has been to simplify as far as possible, and we think that his chapters will go far towards eradicating the idea from the minds of the beginner that the mastery of this subject is difficult and tedious. The author devotes much care and space to a consideration of the etiology ot skin diseases, and following in the main French writers, he considers a certain portion of them as expressions of diatheses. It is needless to say that in his views upon this subject, he is entirely at variance with the German school, while he goes even further than English observers. We need here but mention his chapters on the syphilides, the division being mainly that adopted by Hardy. The general remarks and descriptive portion of this part is quite good. The important cutaneous lesions known as lupus, are described by the author as scrofulides, as he regards them as caused by a scrofulous diathesis. This point is by Piffard taken for granted, as claimed by Hardy, Bazin, Guibout, and others, and he does not discuss the question of the diathesis being the cause. We look upon this as a defect. On the other hand however, he enters into a minute consideration of the histology of these lesions of the skin, reviewing the most recent and previous contributions of others, and analyzing them in the light of his own labors. The result is valuable as a contribution to an obscure portion of dermatology, though we must express our surprise that, by his studies, the author has arrived at the conclusion that rodent ulcer is simply a form of lupus. It is well, in using the work as a text-book, to bear these views of the author in mind. As to the so-called dartrous or herpetic, we find Piffard also leans to the theories of French authors. He, however goes further than they do, and endeavors to determine the nature of the diathesis. Following Beuce Jones and Gigot Suard, he arrives at the conclusion that the systemic condition is one of sub-oxidation of the tissues, a state similar to that of the rheumatic habit. He therefore proposes to call the affections rheumides, instead of dartres and herpetides of the French. It is to be regretted that in this question we have a surfeit of theory and few demonstrated facts. Taking this diathesis as an essential cause, we find that, according to the views of Piffard, it is at the *fons et origo* of exzema, psoriasis and pityriasis, which latter affection the author considers a distinct entity. The various other skin diseases are briefly described in the order of a classification which the author has originated. The clinical descriptions are in the main excellent, while the directions for treatment are very practical. Throughout the work we find evidence of good original work, chiefly in the way of histological research. The illustrations of this part of the subject are mostly original, and are chiefly valuable to those having a previous knowledge of the subject. Taken all in all the work is a valuable one, and will prove useful in the field for which it was intended by its author. Those who do not accept, as fully as does the author, the existence of the diatheses named, need but pass over the portion treating thereon and turn to the practical part, where they will find useful reading. We are pleased to see a terseness of expression much to be admired in such a book. The whole appearance of the work is most excellent.

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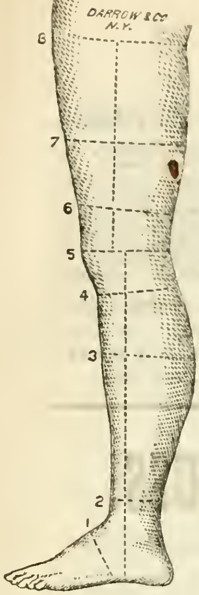

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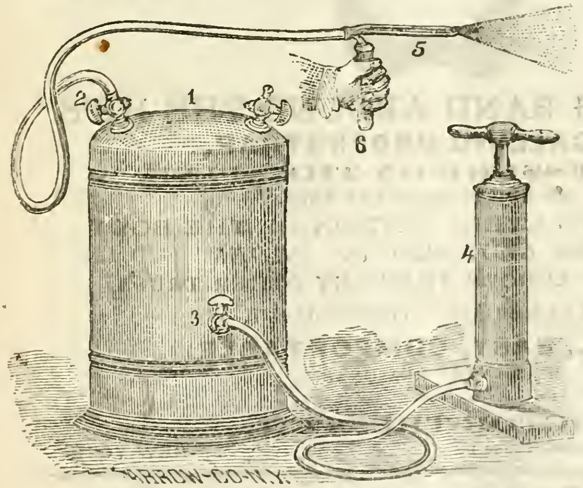

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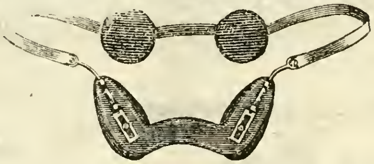

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